

Level 5 Drinking Water Examinations

Applications to take the Level 5 exams can be found at www.michigan.gov/deqoperatortraining. Once on the website, in the column under Drinking Water, click on **Exam Applications and Study Guides**

Exam Content: Level 5 exams are 25 questions in length and are multiple choice. The design of the questions has been selected so that they are clear, not misleading or tricky. Note that the exam subjects and the number of questions on the exam may change without notice.

Things to focus on when studying for the exam:

(Basically know the definitions and some general information about the following items)

S- 5 & D- 5 Level Exams

Water Quality

Water hydrology, what an aquifer is, groundwater characteristics, what a water table is, the difference between ground water and surface water, drinking water aesthetics (hardness, iron, sulfur, manganese, etc.)

Well Construction

Types of wells, drawdown, well screens, components of a well, well depth & construction requirements, importance/when you need a permit, what grout is, well pump general information, casing requirements, how to prevent contamination of wells

Wellhead Protection

Standard isolation distances, well abandonment

Public Health

Acute vs. chronic illness, coliform bacteria, pathogenic organisms, waterborne disease outbreaks, disinfection, "blue-baby syndrome"

Compliance & Safe Drinking Water Act (general questions)

What primacy is, what law governs drinking water, where samples should be taken, sampling requirements, certified operator requirements, waivers, sanitary surveys

Monitoring & Reporting

What a public notice is, when to issue public notices, where you can send samples, use of lab bottles, handling of bottles, how to properly sample, filling out lab forms, sample holding times, what to do with lab results, follow up sampling requirements, how many samples are needed per analyte* test, where samples for each analyte* is to be taken, how long you have to keep sample results, why substances are added to sample bottles.

*an analyte is a substance or chemical constituent that is undergoing analysis.

Maximum Contaminant Levels (MCL's)

What an MCL is, what a monitoring violation is, what the MCL's are for each analyte, what can cause an MCL, what the presence of E. Coli indicates, what the purpose of enforcing an MCL is.

Lead & Copper Rule

What the lead & copper action levels are, where to collect samples, what "lead-free" means, how many samples are required, what "first draw" means, health effects of lead/copper exposure, what 90th percentile action level means, how lead/copper gets into the drinking water supply.

Record Keeping

How long records are to be kept for each analyte, public notice & emergency posting, where records are to be kept.

General Questions

Proper materials & design of distribution system, storage & pumps purpose of sampling site plans, what continuous positive pressure is.

Cross Connection Control

Be able to define backflow, back siphonage, cross connection, know what the backflow prevention devices are (air gap, check valves, atmospheric vacuum breakers, reduced pressure zone device, etc.) and when to use them, how cross connections occur, and how to prevent cross connections.

Operation & Maintenance

Who is responsible, what it means to be NSF/ANSI approved, what the essential elements are for the operation of a water system, problem solving when trouble occurs, contingency plans, emergency responses, safety issues, what federal law regulates safety issues, confined space regulations

Additional D-5 Level Exam topics:

Chlorination/disinfection

What chlorine is used for, what free chlorine residual is, handling of chlorine, chlorine characteristics, what test kits to use, how to disinfect

Treatment Technologies

What the different methods for treating water are, what phosphate is used for, advantages/disadvantages of using treatment, how to maintain a treatment system, what potassium permanganate is

Review materials recommended for study:

Safe Drinking Water Act (SDWA), Act 399 of 1976, as revised (can be found on the Internet at the www.michigan.gov/deg, **Water, Drinking Water, Noncommunity Water Supply**)

Brochures and study guides from local health dept. or DEQ

(contact your local health dept. or go to above listed internet site)

Other references on drinking water that may be helpful (these are suggestions; you do not have to purchase all of these; see www.michigan.gov/degoperatortraining "Publications..." for ordering some of the following and/or other references)

- Small Water system Operation & Maintenance, California State University, Sacramento, CA, 4th edition
- Water Distribution System Operation & Maintenance, California State University, Sacramento, CA, 4th edition
- AWWA Manual on Recommended Practice for Backflow Prevention and Cross-connection Control (<http://www.AWWA.org>)
- *MDEQ Cross Connection Rules Manual* (contact MDEQ Water Bureau)
- Practices, Waterborne Pathogens, AWWA M48, American Water Works Association, 1999
- <http://www.epa.gov/safewater/index.html>